

Claims

1. A method of optically detecting the three-dimensional shape of an interior space, characterized in that said interior space is provided with an elastic envelope (2) in snug contact with the inner wall and marked with marks (3) facing the 5 inside of the space and adapted to be evaluated photogrammetrically, in that a number of overlapping image recordings of said interior space marked in this way are produced with the aid of one or more imaging devices (4, 9), and in that photogrammetrical methods are used for determining from said recordings the three-dimensional shape of that part of said interior space that was detected by 10 said overlapping recordings.
2. The method according to claim 1, characterized in that the side of the marked envelope (2) facing the inner wall is provided with a means adhering to said inner wall prior to insertion into the interior space.
3. The method according to claim 2, characterized in that an inflatable cover 15 is inserted into the marked envelope (2), said envelope (2) is placed into the interior space with said cover and there said envelope is pressed against the inner wall of the interior space to be detected by admitting internal pressure into said cover such that it is in snug contact with said inner wall, and in that afterwards said cover is relieved from pressure and removed, in order to make room for the 20 insertion of one or more imaging devices.
4. The method according to any of claims 1 to 3, characterized in that the interior space constitutes the interior of a product (1) which is in contact with the human body during use.
5. The method according to claim 4, characterized in that the interior space is 25 the interior of footwear (1).
6. The method according to claim 4, characterized in that the interior space is the interior of a prosthesis funnel for receiving a limb stump .

7. The method according to any of claims 1 to 3, characterized in that the interior space is the interior of an orifice of the body.
8. The method according to any of claims 1 to 7, characterized in that a video camera (4) is used as imaging device and that the overlapping image recordings of the interior space are recorded in the form of one or more video sequences.
9. The method according to any of claims 1 to 3 and 8, characterized in that the imaging device(s) (4) is/are rotated axially and successively record(s) both axially and radially overlapping recordings of the marked interior space.
10. The method according to any of claims 1 to 3, characterized in that the imaging device(s) (4) inside the interior space is/are put into the different overlapping recording positions.
11. The method according to any of claims 1 to 3, characterized in that the interior space is mapped on the imaging device (9) in radial bands via a collar-shaped mirror (8).
12. The method according to any of claims 1 to 3, characterized in that the imaging device(s) (9) is/are guided in the interior space by spacers.
13. The method according to any of claims 1 to 3, characterized in that the overlapping image fields are transmitted from the interior space to one or more imaging device(s) (9) located outside the interior space via an endoscopic system.
14. An arrangement for performing the method according to any of claims 1 to 13, characterized by a thin, elastic envelope (2) that is provided with marks (3) adapted to be photogrammetrically evaluated and that can be placed into an interior space to be scanned three-dimensionally, so that it snugly lines the wall defining said interior space, further by one or more imaging device(s) (4, 9) that can be guided through the interior space in such a way that they record overlapping image recordings of said marked thin envelope (2) and by a computer, to which image sequences of the image recordings are transmitted and which forms lists of homologous marks from the images of the image sequences

using an image processing program, and which calculates from the list of homologous marks the 3D-coordinates of the interior space at the positions of these marks using a photogrammetrical program.

15. The arrangement according to claim 14, characterized in that the thin  
5 elastic envelope (2) is made of an elastic knitwear, a knitted fabric or a woven  
fabric.